below, and perhaps by the Connecticut. I have supposed the plant to be a relic of cultivation, as it has been cultivated in Royalton, and the colony may have started from a place two miles above the present station. A small brook passes through the place and seed may easily have been conveyed by the brook to the river.

In 1890 I saw the plant in a cemetery lot one mile up river from the established station, and not far from the bank. But it is hardly possible that seed could have been carried thence by water agency. So far as I know it is not conspicuously spreading.— LEVI WILD, Franklin, Vt.

BOLETI COLLECTED AT ALSTEAD, N. H.

H. WEBSTER.

A STAY of five weeks in the hill town of Alstead, N. H., in July and August, 1899, repeated in 1900, has given opportunity for the collection of many fleshy fungi. Among them, and peculiar to the season, are numerous species of Boleti, on which, in view of the increasing attention given to these plants, a few notes may not be out of place. The collections were made by roadsides, on open and wooded hillsides, and in the hollows between the hills, usually in woods. Alstead Centre is in the northern part of Cheshire County six miles east from the Connecticut River, at an altitude of 1120 feet.

Since the seasons, both in 1899 and 1900, were unusually dry in the region, a large and continuous crop of fleshy fungi was not to be expected, and collections on the whole were rather meagre. Nevertheless, here and there a mossy slope, or a springy bank, or a mass of water-soaked decaying wood, held moisture enough to prevent the total non-appearance of the fungi naturally sought in such places; and well-shaded brooksides, swamps, and bogs were explored, not without success. Indeed the variety, if not the abundance of fleshy fungi was sufficient to keep interest unflaggingly alive, and to furnish material for constant study.

A word as to the treatment of the material collected may be suggestive to others similarly situated, especially if they would preserve Boleti. The process of drying, usually the stumbling block in the field, was as follows. In the first place a visit was made to the tinsmith, who

for a few dollars constructed a sheet iron box with shelves of wire netting. The dimensions of such a box may be adjusted to suit individual needs. A convenient size is four feet high by two feet square or less, with sliding shelves three inches apart. These should be of strong coarse wire netting, bound at the edges. Small squares of fine wire netting are convenient, also, for the reception of collections of small species. These can be laid on the shelves. The box is without a top and without a bottom, with a door in front, where it is held from collapsing by bands of sheet iron above and below the door. At the very bottom holes around the sides admit air. A kerosene stove completes the equipment. The height of this determines the position of the lowest shelf, on which it is well to lay a small plate of tin or glass, directly above the lamp, to distribute the heat. With this apparatus, the lamp with a low flame, relays of fungi may be conveniently dried; a lot put in in the evening will dry in the course of the night. When dry they may be allowed to accumulate on driers heaped on floor or table until a misty or rainy atmosphere renders them flexible enough to be put to press. Some five hundred collections were treated successfully in this way in five weeks in 1900. It seems probable that a portable drying box of the kind described, that could be arranged to fold or clamp at the corners, might easily be made.

Among the fleshy fungi, properly so called, collected at Alstead, the Boleti are prominent, as was to be expected, in a number of species. The following list, with notes, will show what it was possible to find among the hills of New Hampshire in a dry season.

It is natural, of course, to find *Boletinus pictus* Peck in every sphagnum bog, and on the mossy hummocks in wet woods, especially where there is abundance of decayed wood. It appears in Alstead at least as early as July 4, and probably earlier. Occasionally a rotten log may be found bearing a half dozen fruits in various stages, when the mycelial strands may be disclosed by tearing the log to pieces. All specimens examined had the solid stem and the dark red color required by the author's description, but were slightly umbonate. As found about Boston the species appears closer to *B. cavipes* Kalch., for the stem is usually hollow at the base, although the color is not that ascribed to the latter species.

Boletinus porosus (Berk.) Peck is occasional, but *B. paluster* Peck has not yet been found. It has been collected at Centre Harbor by Mr. C. F. Grover.

Of the viscid Boleti only a few species occur so early in the season. *Boletus Americanus* Peck has been repeatedly collected. Reports of it are not infrequently to be referred to *Boletinus pictus*, which in its late stages loses most of its tomentum and appears very yellow. *B. albus* Peck has occurred several times in open woods, and *B. granulatus* L. more often, though not in its autumnal abundance. One or two specimens intermediate between the two, but inclining towards *B. albus* suggest the close affinity of the two species. I have generally found, however, that in *B. albus* the pileus is small in comparison with the length of the stem.

The only other members of the section Viscipelles so far found about Alstead are *B. rubinellus* Peck, and *B. piperatus* Bull, two species which hardly show any viscidity, except in wet weather. The former grows in small quantity in two or three localities, one of which is in mixed woods, and another on an open hillside in moss just at the edge of a hemlock grove; one or two plants grew on decayed wood. Although at first glance much like *B. piperatus*, especially when the pores have become brown, the red and yellow tints of pileus and stem easily distinguish *B. rubinellus*. In its young state its coloring is most attractive, the comparatively large pores and often the upper part of the stem being of a peculiar red — almost Indian red in one instance. With the ripening of the spores this striking tint disappears from the tubes. Some dried specimens still retain a trace of it, and preserve the red and the marginal yellow of the pileus remarkably well. In the dozen or more specimens found, the stem was yellow at the base as in *B. piperatus*, and with yellow flesh; it was minutely flocculose above, and fibrous striate below. The yellowish white flesh of the pileus generally showed a faint band of pink near the pores. The dimensions of the spores were 13½ by 3½ μ, or a little more [12½ to 15 by 4, Peck]. Mature plants were found on July 21, 1899, and somewhat younger ones on July 18, 1900. Whether it will continue to appear at about that date remains to be seen, but it is not improbable that it may always be fairly prompt to date, like some other species, whose limited occurrence both in place and time is in such strong contrast with such plants as *B. scaber*, *B. subtomentosus*, and even *B. piperatus*. The last species is fairly abundant along roadsides and in woods, from the middle of July, or earlier, well into August, and probably later. In dried condition its resemblance to the browner forms of *B. rubinellus* is close. The determination of *B. rubinellus* was kindly confirmed by Mr. Peck.

Of the pruinose and subtomentose boleti, five species out of six or eight found, are easily recognizable. *B. miniato-olivaceus* Frost var. *sensibilis* Peck seems less common than about Boston, certainly not common enough to suggest the dangerous experiment of eating it.[1] It may be remarked, however, that the writer has eaten fresh young specimens of this Boletus (the pores removed) without any other than pleasurable results. Boleti even more than other fungi demand to be eaten as soon as gathered.

B. bicolor Peck, in exact agreement with the author's description, was found under a hemlock on a hillside on July 21, 1899. Its small pores and red stem are conspicuous even in the dried state.

The Boletus that has been found in greatest quantity about Alstead is one that I have referred to *B. subglabripes* Peck. It agrees well with the author's figure in Report 51 of the New York State Museum, and with the description, except that the flesh is usually pale-yellowish or yellowish-white, and the branny particles on the stem, in carefully handled specimens, can hardly be overlooked. Sometimes, a reddish tint appears on the lower part of stem at maturity. The color of the pileus is, in general, dead-leaf brown, with occasional chestnut tints in the pale-yellow color of pores and stem; and in other points, including the dimensions of the olivaceous spores (12½ to 15 by 4 to 5μ, Peck), it agrees well with the description, although the average size of the spores appears to be about 13 by 3½ μ. This Boletus is conspicuous about Alstead by reason of its abundance, and its repeated appearance in woods and along wooded roadsides in July and early August. It has several times been gathered in sufficient quantity to furnish a dish at table, and can be recommended to those who like Boleti. Certain specimens are somewhat pitted or corrugated (var. *corrugis* Peck). This determination has been approved by Mr. Peck.

Of *B. chrysenteron* Fr. a few doubtful specimens have been collected, referred here because of their yellow flesh.

B. subtomentosus L., is common and extremely variable. The points relied on for recognition have been the soft, strongly tomentose pileus, the long, large, depressed, but often decurrent pores, the ribs on the upper part of the stem, the unchanging pale flesh, and the *yellow mycelial strands* at the base of the stem, which is sometimes reddish within.

The Calopodes are so far represented at Alstead by *B. ornatipes*

[1] See RHODORA, 1: 2, pp. 21—23, Feb. 1899.

Peck, which is rather frequent towards the end of July, and by *B. pachypus*, Fr. which has been found twice. The former species, with its prevailing yellow color under a brownish pileus, and strongly reticulate stem, is familiar. The specimens referred to *B. pachypus* are few and somewhat doubtful, still they will go nowhere else. In general they agree well with the description; but the stem is not particularly thick, and the spores are of the usual Boletus type, and not ovate. Their dimensions are 14 by 4 μ (14 by 6 Massee, 12½ to 13¼ by 5 to 6 Peck). More material is needed to confirm this record.

Three species on the list are referable to the Edules. The first of these, *B. separans* Peck, occurs here and there, one or two plants at a time, in July and later, and is generally thick-stemmed and much injured by insects. The brownish-red of the pileus, with often a yellow margin, the lilac tints of the young buttons, and the tendency of the pores to separate from the stem, are fairly constant characters.

Most worthy of note is *B. eximius* Peck. No firmer, heavier Boletus can be found, nor any more instantly recognizable. Its purplish-brown pileus, dark pores, and dark, hard, furfuraceous stem, distinguish it at once. The tubes, it may be noted, are dull ochraceous or pale dead-leaf color, and in a vertical section contrast with the grayish or grayish-purple flesh. This Boletus, which seems not to be frequently collected, occurs sparingly at Alstead in July and August. A fine group of them was found on July 22, 1900, and being unusually free from insects, was welcome as herbarium material.

Boletus affinis Peck, has been collected several times, but rarely in condition for preservation. It is usually very soft, and succumbs quickly to moisture, heat, and insects.

With the exception of one imperfect specimen, very doubtfully referred to *B. Satanas* Lenz, and one specimen which is either *B. alveolatus* B. & C., as described by Frost, or more probably *B. Frostii* Russell, the Luridi are represented only by *B. luridus* Schaeff, in various pale forms. Typical *B. luridus* has been found once. In the specimens met with orange generally took the place of red, and the pores were hardly vermillion. Other characters were good.

The single specimen referred to *B. Frostii* is shining blood-red, with a somewhat uneven pore surface, and flesh which changed to blue. The reticulations of the stem are distinct, and the color strong, but there is no great roughness or raggedness of surface, as in specimens frequently collected in eastern Massachusetts.

The three common species of the section Versipelles are common also at Alstead, the most frequent being, of course, *B. scaber* Fr., which, much to the annoyance of driving parties, has always to be investigated along roadsides, lest something more interesting may be overlooked. There are always exciting possibilities about a glimpsed Boletus. *B. versipellis* Fr. is less frequent, but common enough to earn the neglect of collectors. *B. chromapes* Frost, on the other hand, partly from the attractive contrast of the pink of the pileus and the yellow of the stem, and partly because it occurs less frequently than expected, has usually been brought in when found. It begins to appear late in July.

Two species of Hyporhodii have been collected, *B. gracilis* Peck, which is not common, and *B. felleus* Bull. which is. There is little to be said of either. *B. felleus*, however, is not so large as I am accustomed to see it. A small form of it is not infrequent on stumps, presumably of hemlock, as noted by Peck.

B. cyanescens Bull. and *B. castaneus* Bull. represent the Cariosi, neither of them frequent so far as seen.

Since the preceding account was in type, a few more forms deserving notice have been collected. One of these is plainly referable to *B. badius* Fr., although the viscid cap is hardly shining when dry, and the flesh shows no blue, but after a time a pinkish tint. The stem is somewhat lined and finely brown-punctate. It agrees almost exactly with the figure in Michael's Führer für Pilzfreunde, a little book whose excellent colored plates ought to be better known. *B. affinis* Peck is sometimes confounded with *B. badius*, but is a much softer species, with flesh that usually turns yellowish, and pores that show bright ochraceous tints, whereas those of *B. badius* turn promptly to green when wounded.

A single specimen, which can be only *B. griseus* Frost, was found July 28, 1900, on a drive to Keene. The grayish cap, small white tubes, and beautifully reticulated whitish stem identify it, in spite of some discrepancy in its proportions.

Another single specimen, obtained on the same drive, is a form, akin to *B. luridus* which shows distinctly the characters ascribed to *B. erythropus* Pers. It has a long slender cylindrical stem, the flesh of which is red all through within. Its spores are large, 17 by 6½ μ.

Among many forms, which were at first placed with *B. luridus* one, which was sent to Mr. Peck, has been referred by him to *B. vermiculosus* Peck. The velvety pileus is brown, or yellowish brown; paler

towards the margin; the stem is similar in color, with a close scurfy covering, glabrous and somewhat yellow above, marked with raised lines as in *B. luridus*; the tubes are yellow with brown mouths; the yellow flesh and the tubes change almost instantly to blue. Its spores are "too small for *B. luridus*," being 10 to 11½ by 5 to 5½ μ.

In addition there is the usual remnant of isolated collections awaiting determination, the final disposal of which may increase the list. Specimens of all the species here mentioned are preserved in the herbarium of the Alstead School of Natural History, and many of them also in that of the Boston Mycological Club.

ORCHIDS OF MT. GREYLOCK, MASSACHUSETTS.

A. LeRoy Andrews.

Mt. Greylock, from its foremost position among the mountains of Massachusetts, and its recent promotion to the dignity of a State Reservation, assumes such an importance that a brief consideration of a few of its floral features may not be out of place. The mountain, situated in western Massachusetts, represents a detached spur of the Taconic system and forms an irregular mass several miles in length and breadth, with several peaks and various depressions and eroded valleys. On account of its great extent and its varied conditions of altitude, soil, drainage, and exposure it presents a flora of great interest and variety.

In point of distribution its Orchids especially furnish a study which well rewards investigation. We may conveniently divide the mountain surface into four sets of conditions, marked generally by pronounced floral distinctions, as follows: 1. Unwooded lower slopes including grassy pastures, springy meadows, narrow drainage valleys, etc. 2. Lower wooded slopes. 3. Upper wooded slopes. 4. Clearings, at various elevations, generally thickly overgrown with June grass, sometimes with blueberry bushes, ferns, etc.

In the first-mentioned localities, comparatively dry, steep, hillside pastures yield *Habenaria lacera* and *Spiranthes gracilis*, both very common species of this portion of Massachusetts. The more moist, level places furnish *S. latifolia* and *S. cernua*. Upon a steep bank with a colony of sundew grows *Habenaria tridentata*.